

C L A I M S

1. Method for the production of glycoproteins displaying minimal, uniform and defined sugar residues, comprising cultivating a transgenic plant, parts of transgenic plants or transformed plant cells, and isolating the desired glycoprotein from the material cultivated, characterized in that the transgenic plant, parts of transgenic plants or transformed plant cells, respectively, is/are transformed with an antisense construct or a sense construct, comprising an antisense DNA or a sense DNA with respect to the DNA sequence for a gene or a cDNA for plant N-acetyl glucosaminyl transferase I or a part thereof, for elimination or reduction of the activity of said N-acetyl glucosaminyl transferase, wherein the antisense or sense construct optionally contains additional regulatory sequences for the transcription of the respective antisense or sense DNA.
2. Method according to claim 1, characterized in that for transformation an antisense or sense construct with respect to one of the cDNAs encoding N-acetyl glucosaminyl transferase I from *Solanum tuberosum*, *Nicotiana tabacum* or *Arabidopsis thaliana* is used.
3. Method according to claim 2, characterized in that for transformation an antisense or sense construct with respect to one of the DNA sequences given in SEQ ID NO: 1, 3 or 5 is used.
4. Method according to any of the claims 1 to 3, characterized in that the transgenic plant used is

additionally transformed with the gene encoding the desired glycoprotein.

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5. DNA, characterized in that it encodes N-acetyl glucosaminyl transferase I from *Solanum tuberosum*.

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6. DNA according to claim 5, characterized in that it comprises the nucleotide sequence given in SEQ ID NO: 1 or a part thereof.

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7. DNA, characterized in that it encodes N-acetyl glucosaminyl transferase I from *Nicotiana tabacum*.

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8. DNA according to claim 7, characterized in that it comprises the nucleotide sequence given in SEQ ID NO: 3 or a part thereof.

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9. DNA encoding N-acetyl glucosaminyl transferase I from *Arabidopsis thaliana*, characterized in that said DNA encodes the amino-acid sequence given in SEQ ID NO: 6 or the nucleotide sequence given in SEQ ID NO: 5 or a part thereof.

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10. DNA, characterized in that it comprises the nucleotide sequence complementary to the DNA according to claim 6, 8 or 9.

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11. DNA, characterized in that it may be obtained by substitution, deletion and/or insertion of one or more nucleotides and/or truncation at the 5' and/or 3' end of one of the DNAs according to any of the claims 5 to 10, with the proviso, that said DNA hybridizes at least in a partial region with the starting DNA or its complementary sequence or parts thereof under stringent conditions.

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12. DNA, characterized in that it represents a gene or is part of a gene, which encodes the enzyme N-acetyl glucosaminyl transferase I, and which in its entirety or in a partial region thereof hybridizes under stringent conditions

- to one of the DNA sequences or fragments according to any of the claims 5 to 11 and/or

- to a DNA sequence, which has been derived from the amino acid sequences given in SEQ ID NO: 1, 3 and/or 5, considering the degeneration of the genetic code.

13. DNA construct, characterized in that it comprises one or more of the DNAs according to any of the claims 5 to 14.

14. DNA construct according to claim 13, characterized in that it comprises an antisense or sense DNA with respect to the DNA sequence according to any of the claims 5 to 12 and optionally regulatory sequences for the transcription of the antisense or sense DNA, respectively.

15. Vector, plasmid, cosmid, virus or phage genome, characterized in that it contains at least a DNA and/or construct according to any of the claims 5 to 14.

16. N-acetyl glucosaminyl transferase I from *Solanum tuberosum*.

17. N-acetyl glucosaminyl transferase I from *Nicotiana tabacum*.

18. N-acetyl glucosaminyl transferase I from *Arabidopsis thaliana*, characterized in that the enzyme comprises the amino acid sequence set forth in SEQ ID NO: 6.

19. N-acetyl glucosaminyl transferase I, characterized in
that the enzyme comprises the amino acid sequence set
forth in SEQ ID NO: 2.
20. N-acetyl glucosaminyl transferase I, characterized in
that the enzyme comprises amino acids 74 to 446 of the
amino acid sequence set forth in SEQ ID NO: 2.
21. N-acetyl glucosaminyl transferase I, characterized in
that the enzyme comprises the amino acid sequence set
forth in SEQ ID NO: 4.
22. N-acetyl glucosaminyl transferase I, available due to
hybridization of its gene or one or more of the portions
of its gene to one or more of the DNAs and/or DNA
fragments according to any of the claims 5 to 12.
23. Enzymes or proteins derived from the enzymes according
to any of the claims 16 to 22 by substitution, deletion,
insertion and/or modification of individual amino acids
and/or smaller groups of amino acids and/or by N- and/or
C-terminal truncation and/or extension.
24. Protein or peptide, comprising one or more portions of
the amino acid sequence(s) of one or more of the enzymes
defined in any of the claims 16 to 23.
25. Protein or peptide, encoded by one of the DNAs according
to any of the claims 5 to 12.
26. Antigen, characterized in that it comprises:
- the amino acid sequence given in SEQ ID NO: 2, SEQ ID
NO: 4 or SEQ ID NO: 6, or
- amino acids 74 to 446 of the amino acid sequence given
in Fig. 2, or
- an amino acid sequence derived from the amino acid
sequences given in SEQ ID NO: 2, 4 or 6 by substitution,

deletion, insertion and/or modification of individual amino acids and/or smaller groups of amino acids, or

- one or more parts of said sequences, with the proviso, that upon immunization of a host with the antigen, said antigen may raise an immunological reaction, including the production of antibodies directed against the antigen.

27. Monoclonal or polyclonal antibody, characterized in that it specifically recognizes and binds one or more of the enzymes or antigens according to any of the claims 16 to 26.

28. Microorganism, characterized in that it is transformed by at least one of the nucleotide sequences selected from the DNAs, constructs, vectors, plasmids, cosmids, virus or phage genomes according to one or more of the claims 5 to 15.

29. Transgenic plant, transgenic seed, transgenic reproduction material, parts of transgenic plants or transformed plant cell, obtainable by integration of one or more DNA sequence(s) or construct(s) according to any of the claims 5 to 13 under the control of a promoter effective in plants, into the genome of a plant, or via infection by means of a virus containing one or more DNA sequence(s) or construct(s) according to any of the claims 5 to 13, for an extrachromosomal propagation and expression of the DNA sequence(s) or construct(s) in the plant tissue infected.

30. Transgenic plant, transgenic seed, transgenic reproduction material, parts of transgenic plants or transformed plant cell with missing or reduced N-acetyl glucosaminyl transferase I activity, obtainable by integration of one or more antisense or sense construct(s) according to claim 14 under the control of a promoter

effective in plants, into the genome of a plant, or by
viral infection by means of a virus containing one or
more antisense or sense construct(s) according to claim
14, for an extrachromosomal propagation and
transcription of the antisense construct(s) in the plant
tissue infected.

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